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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/821,281	04/08/2004	Dale M. Pickleman	DEP-0350-R	1046
23413	7590	04/05/2005	EXAMINER	
CANTOR COLBURN, LLP 55 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002			EDGAR, RICHARD A	
			ART UNIT	PAPER NUMBER
			3745	

DATE MAILED: 04/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	10/821,281	PICKLEMAN ET AL. <i>ED</i>
	<b>Examiner</b>	<b>Art Unit</b>
	Richard Edgar	3745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

## Disposition of Claims

4)  Claim(s) 1-55 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5)  Claim(s) \_\_\_\_\_ is/are allowed.  
6)  Claim(s) 1-55 is/are rejected.  
7)  Claim(s) \_\_\_\_\_ is/are objected to.  
8)  Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

9)  The specification is objected to by the Examiner.

10)  The drawing(s) filed on 08 April 2004 is/are: a)  accepted or b)  objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)  The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a)  All b)  Some \* c)  None of:  
1.  Certified copies of the priority documents have been received.  
2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3.  Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1)  Notice of References Cited (PTO-892)  
2)  Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3)  Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 4/8/2004.

4)  Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_ .  
5)  Notice of Informal Patent Application (PTO-152)  
6)  Other: \_\_\_\_ .

***Reissue Applications***

Applicant is reminded of the continuing obligation under 37 CFR 1.178(b), to timely apprise the Office of any prior or concurrent proceeding in which Patent No. 6,439,833 is or was involved. These proceedings would include interferences, reissues, reexaminations, and litigation.

Applicant is further reminded of the continuing obligation under 37 CFR 1.56, to timely apprise the Office of any information which is material to patentability of the claims under consideration in this reissue application.

These obligations rest with each individual associated with the filing and prosecution of this application for reissue. See also MPEP §§ 1404, 1442.01 and 1442.04.

The reissue oath/declaration filed with this application is defective because it fails to identify at least one error which is relied upon to support the reissue application. See 37 CFR 1.175(a)(1) and MPEP § 1414. The declaration attests to a specification error, however, as evidenced by the original filed disclosure, specifically page 23, line 9, the error is merely an editorial error wherein the degree symbol “°” was printed as a zero “0”. This correction does not provide a basis for reissue, and may be corrected by a certificate of correction. See MPEP §§ 1402 and 1481. Regarding applicant’s second supposed error, the declaration does not identify specific claim language wherein the error lies. Applicant has only provided the differences between the new claims and the original claims. There is no clear error in the claims. See MPEP §1414 II (C).

Claims 1-55 are rejected as being based upon a defective reissue declaration under 35 U.S.C. 251 as set forth above. See 37 CFR 1.175.

The nature of the defect(s) in the declaration is set forth in the discussion above in this Office action.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-9 and 21-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent No. 5,807,068 (Dobler et al. hereinafter) in view of United States Patent No. 6,497,552 (Kobayashi et al.) in view of United States Patent No. 5,762,469 (Yu hereinafter).

Dobler et al. show in one embodiment (Figs. 5-7) an impeller for a regenerative turbine pump wherein the impeller comprises a hub having an aperture 24 at about the center thereof, the hub being rotatable about a center axis passing through the aperture, the hub having an outer cylindrical surface 133; a ring 140 having an inner cylindrical surface, the inner cylindrical surface facing the outer cylindrical surface of the hub; and a plurality of vanes 130 extending between the outer cylindrical surface of the hub and the inner cylindrical surface of the ring, each of the vanes having a "v"-shape of

a first angle relative to a plane normal to the center axis, and an entrance portion (interstice 131 above rib 133) that extends from the outer cylindrical surface of the hub and an exit portion that extends from the entrance portion to the inner cylindrical surface of the ring. The first angle lies within a range of about 60° to about 130° for an upstream or downstream face of the vane (see col. 3, lines 65-67).

In the embodiment of Figs. 5-7, the entrance and exit portions are linearly arranged and therefore not non-linearly disposed. Also, the trailing edges of the vanes are not chamfered.

Kobayashi et al. show "v"-shaped vanes for a regenerative turbine impeller wherein the vanes are curved at the entrance portion by about 0° to about 45° and at the exit portion by about 0° to about 45° (see col. 4, lines 22-26) for the purpose of increasing the efficiency of the impeller. A tangent line drawn at a center of the curved vane is perpendicular to the instantaneous rotational direction (see Fig. 4).

Since Dobler et al. teach to improve the efficiency of a regenerative pump impeller by arranging the vanes in a "v"-shape and Kobayashi et al. teach to improve the efficiency of a regenerative pump impeller by curing the "v"-shaped vanes, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the entrance and exit portions of Dobler et al. to be curved, as taught by Kobayashi et al. for the purpose of increasing the efficiency of the impeller.

Yu shows in Fig. 7 a regenerative turbine pump impeller having vanes 54 wherein the vanes are chamfered 70 along the trailing edge 58 thereof for the purpose

of reducing turbulence in the pump. The chamfer is ideally between 5° and 30° (see col. 3, lines 25-28).

Since the modified Dobler et al. (Dobler et al. in view of Kobayashi et al.) show non-linear vanes for a regenerative impeller and Yu teaches that regenerative impeller vanes should have a chamfer on the trailing edge, including non-linear vanes (see Fig. 10), it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the trailing edge of the Dobler et al. vanes to have a chamfer thereon, as taught by Yu, for the purpose of reducing turbulence in the pump.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent No. 5,807,068 (Dobler et al. hereinafter) in view of United States Patent No. 6,497,552 (Kobayashi et al.) in view of United States Patent No. 5,762,469 (Yu hereinafter) as applied to claim 1 above, and further in view of Japanese Patent Application Laid-open 57-81191 (Nishimura hereinafter).

The regenerative pump impeller of the modified Dobler et al. (Dobler et al. in view of Kobayashi et al. in view of Yu) shows a shaft hole, but not a notch at the hole.

Nishimura teach that a regenerative turbine impeller should have a notched aperture (see Fig. 3) for the purpose of securing the impeller onto a complementary shaped shaft.

Since the modified regenerative impeller of Dobler et al. is secured to a shaft, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the aperture of the modified Dobler et al. to be a

notched aperture, as taught by Nishimura, for the purpose of securing the impeller onto a complementary shaped shaft.

Claims 11-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent No. 5,807,068 (Dobler et al. hereinafter) in view of United States Patent No. 5,762,469 (Yu hereinafter).

Dobler et al. show in one embodiment (Figs. 5-7) an impeller for a regenerative turbine pump wherein the impeller comprises a hub having an aperture 24 at about the center thereof, the hub being rotatable about a center axis passing through the aperture, the hub having an outer cylindrical surface 133; a ring 140 having an inner cylindrical surface, the inner cylindrical surface facing the outer cylindrical surface of the hub; and a plurality of vanes 130 extending between the outer cylindrical surface of the hub and the inner cylindrical surface of the ring, each of the vanes having a "v"-shape of a first angle relative to a plane normal to the center axis, and an entrance portion (interstice 131 above rib 133) that extends from the outer cylindrical surface of the hub and an exit portion that extends from the entrance portion to the inner cylindrical surface of the ring. The first angle lies within a range of about 60° to about 130° for an upstream or downstream face of the vane (see col. 3, lines 65-67).

Dobler et al. only show the vanes being radial in the Fig. 5-7 embodiment and therefore not the exit portion inclined forward of the entrance portion, nor a chamfer on the trailing edges of the vanes.

Yu shows an embodiment of regenerative impeller vanes in Fig. 11 wherein an entrance portion extends from a hub 52 circumference and an exit portion 88 is inclined forwardly from the entrance portion. Also, the vanes have a chamfered 70 trailing edge 58. The chamfer is ideally between 5° and 30° (see col. 3, lines 25-28). The angle the exit portion is inclined from the entrance portion is about 15° (col. 4, lines 32-36). The vanes are forward canted for the purpose of increasing the pumping pressure without increase the motor current draw (col. 4, lines 24-26).

Since Dobler et al. show shaped vanes with entrance and exit portions for a regenerative turbine impeller and Yu teach that vanes for a regenerative turbine impeller should be forward canted along the exit portions and chamfered along the trailing edges, it would have been obvious for one having ordinary skill in the art at the time the invention was made to modify the radial vanes of Dobler et al. to be chamfered along the trailing edge and the exit portion forward canted relative to the entrance portion, as taught by Yu, for the purpose of increasing the pumping pressure without increase the motor current draw.

Claims 32-35 and 37-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent No. 5,807,068 (Dobler et al. hereinafter) in view of United States Patent No. 6,497,552 (Kobayashi et al.).

Dobler et al. show in one embodiment (Figs. 5-7) an impeller for a regenerative turbine pump wherein the impeller comprises a hub having an aperture 24 at about the center thereof, the hub being rotatable about a center axis passing through the

aperture, the hub having an outer cylindrical surface 133; a ring 140 having an inner cylindrical surface, the inner cylindrical surface facing the outer cylindrical surface of the hub; and a plurality of vanes 130 extending between the outer cylindrical surface of the hub and the inner cylindrical surface of the ring, each of the vanes having a "v"-shape of a first angle relative to a plane normal to the center axis, and an entrance portion (interstice 131 above rib 133) that extends from the outer cylindrical surface of the hub and an exit portion that extends from the entrance portion to the inner cylindrical surface of the ring. The first angle lies within a range of about 60° to about 130° for an upstream or downstream face of the vane (see col. 3, lines 65-67).

In the disclosed embodiment the entrance and exit portions are not disposed at a second angle relative to a second plane passing through the center axis and normal to the direction of rotation of the impeller.

Kobayashi et al. show "v"-shaped vanes for a regenerative turbine impeller wherein the vanes are curved at the entrance portion by about 0° to about 45° and at the exit portion by about 0° to about 45° (see col. 4, lines 22-26) for the purpose of increasing the efficiency of the impeller.

Since Dobler et al. teach to improve the efficiency of a regenerative pump impeller by arranging the vanes in a "v"-shape and Kobayashi et al. teach to improve the efficiency of a regenerative pump impeller by curing the "v"-shaped vanes, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the entrance and exit portions of Dobler et al. to be curved, as taught by Kobayashi et al. for the purpose of increasing the efficiency of the impeller.

Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent No. 5,807,068 (Dobler et al. hereinafter) in view of United States Patent No. 6,497,552 (Kobayashi et al.) as applied to claim 32 above, and further in view of Japanese Patent Application Laid-open 57-81191 (Nishimura hereinafter).

The regenerative pump impeller of the modified Dobler et al. (Dobler et al. in view of Kobayashi et al.) shows a shaft hole, but not a notch at the hole.

Nishimura teach that a regenerative turbine impeller should have a notched aperture (see Fig. 3) for the purpose of securing the impeller onto a complementary shaped shaft.

Since the modified regenerative impeller of Dobler et al. is secured to a shaft, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the aperture of the modified Dobler et al. to be a notched aperture, as taught by Nishimura, for the purpose of securing the impeller onto a complementary shaped shaft.

Claims 43, 45, 52-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent No. 5,807,068 (Dobler et al. hereinafter) in view of United States Patent No. 5,762,469 (Yu hereinafter).

Dobler et al. show in one embodiment (Figs. 5-7) an impeller for a regenerative turbine pump wherein the impeller comprises a hub having an aperture 24 at about the center thereof, the hub being rotatable about a center axis passing through the

aperture, the hub having an outer cylindrical surface 133; a ring 140 having an inner cylindrical surface, the inner cylindrical surface facing the outer cylindrical surface of the hub; and a plurality of vanes 130 extending between the outer cylindrical surface of the hub and the inner cylindrical surface of the ring, each of the vanes having a "v"-shape of a first angle relative to a plane normal to the center axis, and an entrance portion (interstice 131 above rib 133) that extends from the outer cylindrical surface of the hub and an exit portion that extends from the entrance portion to the inner cylindrical surface of the ring. The first angle lies within a range of about 60° to about 130° for an upstream or downstream face of the vane (see col. 3, lines 65-67).

Dobler et al. do not show the entrance and exit portions being chamfered along a trailing segment thereof.

Yu shows in Fig. 7 a regenerative turbine pump impeller having vanes 54 wherein the vanes are chamfered 70 along the trailing edge 58 thereof for the purpose of reducing turbulence in the pump. The chamfer is ideally between 5° and 30° (see col. 3, lines 25-28).

Since Dobler et al. show vanes for a regenerative impeller and Yu teaches that regenerative impeller vanes should have a chamfer on the trailing edge, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the trailing edge of the Dobler et al. vanes to have a chamfer thereon, as taught by Yu, for the purpose of reducing turbulence in the pump.

Claims 44, 46-48 and 50-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent No. 5,807,068 (Dobler et al. hereinafter) in view of United States Patent No. 5,762,469 (Yu hereinafter) as applied to claim 43 above, and further in view of United States Patent No. 6,497,552 (Kobayashi et al.).

Dobler et al. in view of Yu (modified Dobler et al. hereinafter) shows in one embodiment (Dobler et al., Figs. 5-7) an impeller for a regenerative turbine pump wherein the impeller comprises a hub having an aperture 24 at about the center thereof, the hub being rotatable about a center axis passing through the aperture, the hub having an outer cylindrical surface 133; a ring 140 having an inner cylindrical surface, the inner cylindrical surface facing the outer cylindrical surface of the hub; and a plurality of vanes 130 extending between the outer cylindrical surface of the hub and the inner cylindrical surface of the ring, each of the vanes having a "v"-shape of a first angle relative to a plane normal to the center axis, and an entrance portion (interstice 131 above rib 133) that extends from the outer cylindrical surface of the hub and an exit portion that extends from the entrance portion to the inner cylindrical surface of the ring. The first angle lies within a range of about 60° to about 130° for an upstream or downstream face of the vane (see col. 3, lines 65-67).

In the disclosed Dobler et al. embodiment, the entrance and exit portions are not disposed at a second angle relative to a second plane passing through the center axis and normal to the direction of rotation of the impeller.

Kobayashi et al. show "v"-shaped vanes for a regenerative turbine impeller wherein the vanes are curved at the entrance portion by about 0° to about 45° and at

the exit portion by about 0° to about 45° (see col. 4, lines 22-26) for the purpose of increasing the efficiency of the impeller.

Since the modified Dobler et al. teaches to improve the efficiency of a regenerative pump impeller by arranging the vanes in a "v"-shape and Kobayashi et al. teach to improve the efficiency of a regenerative pump impeller by curing the "v"-shaped vanes, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the entrance and exit portions of the modified Dobler et al. to be curved, as taught by Kobayashi et al. for the purpose of increasing the efficiency of the impeller.

Claim 49 is rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent No. 5,807,068 (Dobler et al. hereinafter) in view of United States Patent No. 5,762,469 (Yu hereinafter) as applied to claim 43 above, and further in view of Japanese Patent Application Laid-open 57-81191 (Nishimura hereinafter).

The regenerative pump impeller of the modified Dobler et al. (Dobler et al. in view of Yu) shows a shaft hole, but not a notch at the hole.

Nishimura teach that a regenerative turbine impeller should have a notched aperture (see Fig. 3) for the purpose of securing the impeller onto a complementary shaped shaft.

Since the modified regenerative impeller of Dobler et al. is secured to a shaft, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the aperture of the modified Dobler et al. to be a

notched aperture, as taught by Nishimura, for the purpose of securing the impeller onto a complementary shaped shaft.

***Cited Art***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Japanese Patent Application Laid-open 57-5594 is cited for showing a regenerative pump impeller having rear-canted entrance portions (see Fig. 6).

United Kingdom Patent Application GB 2 253 010 A is cited for showing v-shaped regenerative vanes with a chamfer on the entrance portions.

***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard Edgar whose telephone number is (571) 272-4816. The examiner can normally be reached on Mon.-Thur. and alternate Fri., 7 am- 5 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Look can be reached on (571) 272-4820. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Richard Edgar  
Examiner  
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3/31/05